

What is claimed is:

1. A cascade genetic circuit comprising:

one or more nucleic acid constructs encoding a plurality of transcriptional regulators, said encoded regulators arranged in a hierarchical order such that expression of an upstream regulator from said plurality stimulates expression of a downstream regulator from said plurality; and

a final target promoter, said final target promoter responsive in a dose-dependent fashion to a terminal downstream regulator of said plurality of regulators.

2. The cascade genetic circuit of claim 1 further comprising a multiple cloning site downstream of said final target promoter.

3. The cascade genetic circuit of claim 1 wherein at least one of said one or more nucleic acid constructs is present as a chromosomal integration.

4. The cascade genetic circuit of claim 1 wherein at least one of said one or more nucleic acid constructs is present as an autoreplicative plasmid.

5. The cascade genetic circuit of any of claims 1-4 wherein at least one of said plurality of transcriptional regulators is responsive to an inducer.

6. The cascade genetic circuit of claim 5 wherein said inducer is capable of inducing the expression of more than one of said plurality of regulators.

7. The cascade genetic circuit of claim 6 wherein said inducer is a benzoate derivative.

8. The cascade genetic circuit of claim 7 wherein said benzoate derivative is salicylate.
9. A cell comprising the cascade genetic circuit of any of the preceding claims.
10. The cell of claim 9, said cell selected from the group consisting of prokaryotic and eukaryotic cells.
11. The cell of claim 10 wherein said cell is a eukaryotic cell selected from the group of eukaryotic cells consisting of mammalian, insect, yeast, and plant.
12. The cell of claim 9 wherein said cell is a bacterial cell.
13. The cell of claim 12 wherein said bacterial cell is a gram-negative bacterial cell.
14. A method of regulating the expression of a nucleic acid sequence, comprising:
establishing a cascade genetic circuit according to any of claims 1-8;
placing said nucleic acid sequence under control of said final target promoter; and
inducing said cascade genetic circuit to stimulate expression of said nucleic acid sequence.
15. The method of claim 14 wherein said nucleic acid sequence encodes a member selected from the group consisting of enzymes, hormones, growth factors, apolipoproteins, therapeutic proteins, diagnostic molecules or proteins, anti-sense molecules, ribozymes, rRNA, tRNA, snRNAs, and portions or derivatives thereof.
16. The method of claim 15 wherein said encoded member is a diagnostic reporter molecule.